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" 4. *Amaurochaetaceæ* Rost.
" 5. *Brefeldiaceæ* Rost.
" 6. *Enerthenemaceæ* Rost.
ORDER ANEMEÆ Rost.
Family 1. *Liceaceæ* Rost.
" 2. *Clathroptychiaceæ* Rost.
ORDER HETERODERMEÆ Rost.
Family 1. *Cribrariaceæ* Rost.
ORDER COLUMELLIFERÆ Rost.
Family 1. *Riticalariaceæ* Rost.
ORDER CALONEMEÆ Rost.
Family 1. *Perichaenaceæ* Rost.
" 2. *Arcpriaceæ* Rost.
" 3. *Trichiaciæ* Rost.
Appendix. ORDER SOROPHOREÆ Zoph.
Family 1. *Guttubineæ* Zoph.
" 2. *Dictyosteliaceæ* Rost.
Sub Cohort II. **Monadineae** Cienk.
ORDER MONADINEÆ AZOOSPOREÆ Zopf.
Family 1. *Vampyrelleæ* Zopf.
" 2. *Burrsullineæ* Zopf.
" 3. *Monocystaceæ* Zopf.
ORDER MONODINEÆ ZOOSPOREÆ Zopf.
Family 1. *Pseudosporeæ* Zopf.
" 2. *Gymnococcaceæ* Zopf.
" 3. *Plasmodiodiophordæ* Zopf.
ORDER USTILAGINEÆ Tul.

Artificially divided into "Amerosporeæ" "Didymosporeæ" and "Dictyosporeæ."

ORDER UREDINEÆ Brongn.

Artificially divided into "Amerosporeæ" "Didymosporeæ" and "Dictyosporeæ."

The final volume will contain the Discomyceteæ, Tuberaceæ and Satrigomyceteæ, and the whole work will then be one which every student of the Fungi will need to have. The descriptions, while often mere translations or copies of the originals, are in the case of the species of certain groups entirely re-written. The total cost of the whole work will be about one hundred dollars.—*Charles E. Bessey.*

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## ZOOLOGY,

TWO REMARKABLE RADIATES.—In the *Aarsberetning* of the Bergen Museum for 1887 (but recently issued), Dr. D. C. Danielssen describes two interesting forms obtained by the dredge in the recent Norse North Atlantic Expedition. When collected they were regarded as sea anemones allied to Halcampa an l Cerianthus, but anatomical investigation shows them to differ from all Cœlenterates in just that feature which has been regarded as diagnostic of the group, while on the other hand they have many points in common with the actinians. For them Dr. Danielssen has made the Tribe Aegireæ which he defines as "Actinida, with a perfect body cavity (Cœlom) and a developed digestive apparatus consisting of œsophagus, stomach and anus." The two genus are called Fenja and Aegir, names derived from Scandinavian mythology. In general terms they may be described as sea anemones whose so-called stomach (Actinostom of Agassiz) has extended down to the base thus partially (Aegir) or completely (Fenja) separating the digestive from the mesenterical spaces, while in both an anus is developed in the base. In both the cœlome thus formed is divided by twelve perfect septa, but in Aegir these spaces communicate by twelve slender fissures with the rectal area of the digestive tract. In Fenja there are twelve genital pores around the anus, outside the rectum; in Aegir the genitalia are more like those of ordinary sea anemones. Both forms are hermaphrodites.

As will be seen these forms which in every other respect are true sea anemones differ from all cœlenterates in the distinction between digestive and cœlomic cavities. On the other hand they differ from the true Cœlomata in the fact that each cœlomatic space extends the length of the body. While interesting, in a general way, as indicating a possible development of the cœloma of higher animals from the mesenterical space of an actinian, we cannot regard them as being links in the line connecting the Cœlenterata with segmented animals, according to the theories of Balfour and Sedgwick, for that demands the conversion of the cœlenterate mouth into mouth and anus, while the anus of Aegireae is clearly not derived in this way, but is rather a perforation through the base of attachment of the ordinary sea anemone. Occasionally such "anal pores" occur in the Cerianthidæ. An extensive account illustrated by over twenty plates is promised at an early date.

THE EYES OF TRILOBITES.—Mr. J. M. Clarke gives an account of the eyes of the trilobite *Phacops rana* in the *Journal of Morphology*, Vol. II., 1888. He divides the trilobites into two groups, Holochroal and Schizochroal, according as the *external* surface of the cornea is faceted or not. The Phacopidæ belong to the latter group, and their eyes are to be regarded as aggregate rather than compound. The corneal lenses were hollow or filled with some substance different from the cornea. Nothing like a crystalline cone has been preserved. Until maturity the number of eyes in an optical organ increases by the addition of new lenses at the ends of the diagonal rows, and these new lenses are apparently formed by a thinning of the integument. (The reporter would remark that there seems to be a difference in the way in which, according to Mr

Clarke's observations, the visual area is increased in the trilobites and that shown by Mr. Watase's unpublished observations on the eyes of Limulus.) After maturity, although the trilobite may continue to increase in size, senility begins and with it there is a decrease in the number of optical elements.

In a concluding note Mr. Clarke calls attention to the fact that in the Leptostracan genus Mesothyra of the Portage (Devonian) group "the eye consists of a single deep pit at the summit of the optic node."

THE SEXES OF MYXINE.—Dr. Fridtjof Nansen (Bergens Museum's *Aarsberetning*, 1887) states that in his studies of the nervous system of Myxine he was struck by the fact that it semed as if females only came under review. He therefore investigated the subject, and after reviewing the more prominent papers and detailing his own investigations states his conclusions that "Myxine is generally or always (?), in its young state, a male; whilst at a more advanced stage it becomes transformed into a female." The genital organs are female in front and male behind. Nansen has investigated the spermatogenesis but his results are widely at variance with those of Cunningham. He has also tried, but in vain, to obtain the embryology of this form. Myxine is extremely abundant at Bergen, but dredging in the harbor at all seasons of the year has failed to produce a single ovum. He has tried to breed them in confinement but though gravid females were kept in wooden cages for half a year they obstinately refused to lay their eggs. From his studies of ovaries he concluded that eggs were deposited at all seasons of the year, and he adds to our knowledge of specimens of the eggs of Myxine by recording one dredged in 1857 by Dr. Danielssen and his son near Molde. Nansen does not seem to be familiar with a paper by Putman on Myxine and Bdellostoma in the *Proceedings* of the Boston Society of Natural History some years ago.

ZOOLOGICAL NEWS.—PROTOZOA.—Mr. Beddard, in his earthworm studies, has recently met (Proc. Zool. Soc., London, 1888, p. 355) a gregarine in the body cavity of a New Zealand Perichæta which is remarkable among gregarines in forming a nucleated cyst.

Dr. L. Plate (*Zool. Jahrbuch*, III., 1888) describes under the name Acinetoides a new infusorian, of which two species were found at Naples, which seems to connect the Acinetæ and Ciliata. It bears a clubbed suctorial thread for taking food, which is shorter and stiffer than those in the true Acinete ; and it possesses besides longitudinal rows of cilia on the ventral surface. Acinetoides forms colonies and has been seen to divide transversely.

CŒLENTERATA.—Gireg describes and figures as new (Bergens Museum's *Aarsberetning* for 1887) *Rhizoxenia alba* and *Sympodium margaritaceum* from the Norwegian coast.